I Claim:

1.        A system for interconnecting a plurality of computing devices comprising:

a shared communication medium;

5        a plurality of transceivers having a first and second port, said first port for connection to one of a plurality of computing devices and said second port for connection to said shared communication medium, each of said transceivers further comprising a transmitter and receiver for transmitting and receiving time domain signals representing data, said time domain signals comprising a

10      plurality of modulated carriers of predetermined frequency over said shared communication medium to at least any one of other said transceivers;

said receiver having a signal transformer for generating a frequency domain signal from said received time domain signal, and a frequency domain equalizer for operating on said frequency domain signal, said equalizer

15      comprising a single tap filter for each carrier of said plurality of modulated carriers received by said transceiver;

said transmitter transmitting at least one known symbol on at least two non-adjacent carriers and transmits data symbols on carriers between said at least two non-adjacent carriers, and wherein said frequency domain equalizer

20      generates said filter taps for each said carrier in response to said at least one known symbol on at least two non-adjacent carriers.

2.      The system of claim 1 wherein said transmitter transmits said known symbols on every $N^{th}$ carrier, where N is any integer greater than 1.

3.      The system of claim 1 wherein said equalizer generates said filter taps by interpolating points between the received said at least one known symbol.

4.      The system of claim 1 wherein said equalizer updates said filter taps by calculating averages of said known symbols for each of said at least two carriers and interpolating points between said averages.

5.      The system of claim 4 wherein said at least two carriers are equally spaced among said plurality of modulated carriers.

6.      The system of claim 1 wherein said transmitter does not transmit energy in the POTS frequency range.

7.      The system of claim 1 wherein said multi-carrier modem selectively transmits on fewer than all of said plurality of predetermined frequencies.

8.      A network adapter device for connecting a computing device to a shared electrical signaling medium comprising:

a first physical interface for connection to a computing device;

a second physical interface for connection to a shared electrical signaling

5      medium; and

a transceiver connected to said first and second physical interfaces for transmitting and receiving data on said first interface and transmitting and receiving modulated multi-carrier data bursts over said second interface, wherein each said burst comprises a plurality of frames, said transceiver

10      including a signal transformer for converting received time domain signals to frequency domain signals, and a frequency domain equalizer connected to said signal transformer for processing said frequency domain signals, said equalizer comprising a single tap filter for each carrier of said modulated multi-carrier data burst received by said transceiver;

15      wherein said equalizer generates said filter taps for each carrier by interpolating a channel response from received known symbols.

9.      The network adapter device of claim 8 wherein said first physical interface is a standard computer internal bus interface.

20

10.     The network adapter device of claim 8 wherein said first physical interface is a standard external bus interface.

11.     The network adapter device of claim 8 wherein said equalizer taps are updated by averaging received known symbols and re-interpolating a channel impulse response.

12.     The network adapter device of claim 8 wherein said signal transformer performs a discrete Fourier transform.

13.     The network adapter device of claim 8 wherein said transceiver operates in a frequency range above the frequency range of POTS services.

14.     The network adapter device of claim 8 wherein said multi-carrier transceiver utilizes a plurality of predetermined carrier frequencies and selectively transmits on less than all of said plurality of predetermined carrier frequencies.

15.     A method of transferring data among a plurality of computing devices connected to a shared communication medium comprising the steps of:

        receiving data from a computing device;

mapping the data to a plurality of sets of signal points where each signal point is assigned a carrier, and including predetermined signal points assigned to predetermined carriers in at least one set where the points are spaced at an interval of every $N^{th}$ carrier;

5        transforming each signal point set to a time domain signal;

transmitting the time domain signals to a plurality of computing devices over a shared communication medium;

receiving time domain signals from the shared communication medium;

converting the time domain signals to frequency domain signals;

10       interpolating equalizer filter taps based on the predetermined signal points; and

filtering said frequency domain signals using the interpolated equalizer filter taps.

15    16. The method of claim 15 where the step of transforming includes performing a frequency domain to time domain transform.

17. The method of claim 15 wherein the interval of every Nth carrier is an integer selected from 2, 4, 6, and 8.

20

18. The method of claim 15 further comprising the step of updating the equalizer after every frame using the most recently received set of included predetermined signal points.

5    19. The method of claim 15 wherein the shared communication medium is standard POTS wiring.

20. The method of claim 15 wherein the predetermined signal points are assigned to predetermined carriers in every frame.

10